2B
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STEREO GRAPHIC EQUALIZER

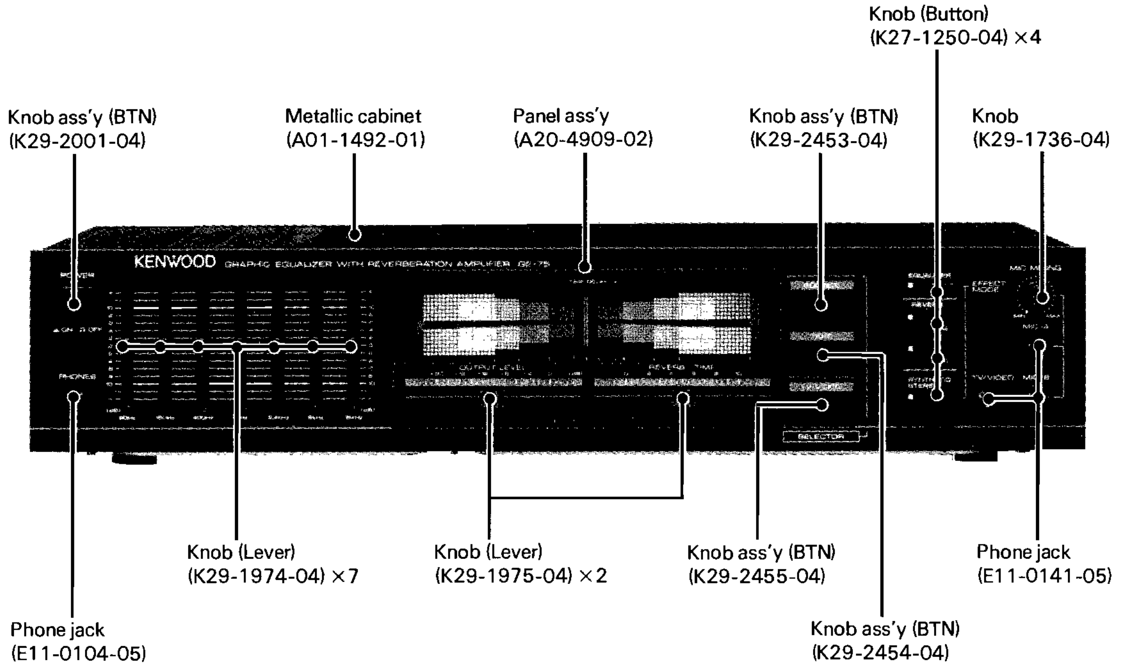
GE-75

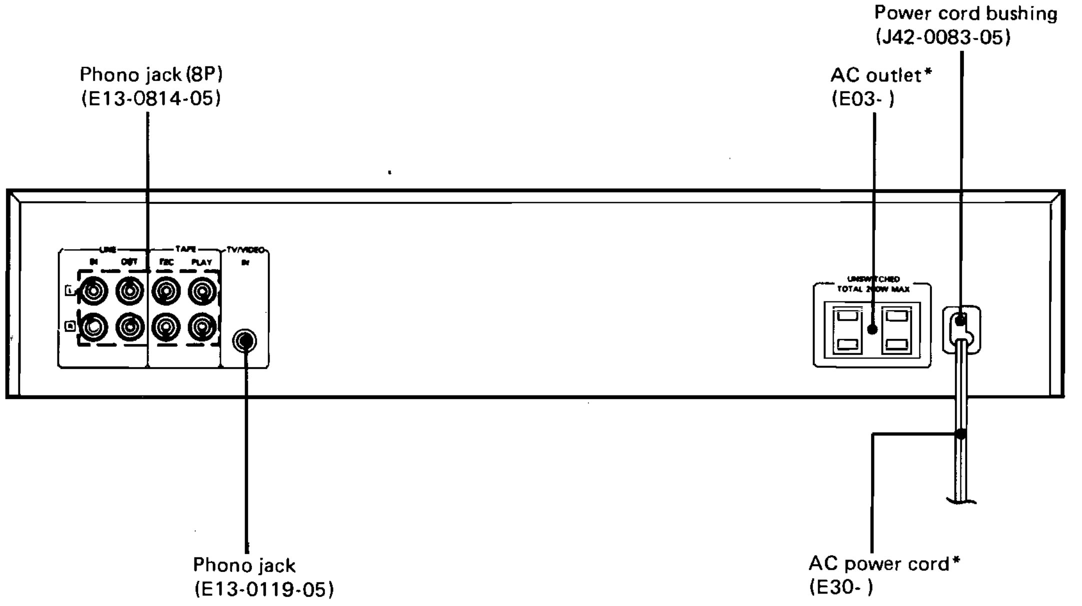
SERVICE MANUAL

KENWOOD

TRIO-KENWOOD CORPORATION

©1986-4 PRINTED IN JAPAN
B51-1967-00(B)2338


Knob (Button)
(K27-1250-04) ×4
Knob ass'y (BTN)
(K29-2001-04)
Metallic cabinet
(A01-1492-01)
Panel ass'y
(A20-4909-02)
Knob ass'y (BTN)
(K29-2453-04)
Knob
(K29-1736-04)
KENWOOD GRAPHIC EQUALIZER WITH REVERBERATION AMPLIFIER GE-75
Knob (Lever)
(K29-1974-04) ×7
Knob (Lever)
(K29-1975-04) ×2
Knob ass'y (BTN)
(K29-2455-04)
Phone jack
(E11-0141-05)
Phone jack
(E11-0104-05)
Knob ass'y (BTN)
(K29-2454-04)


Power cord bushing
(J42-0083-05)
Phono jack (8P)
(E13-0814-05)
AC outlet*
(E03-)
Phono jack
(E13-0119-05)
AC power cord*
(E30-)

*** Refer to parts list on page 6.**

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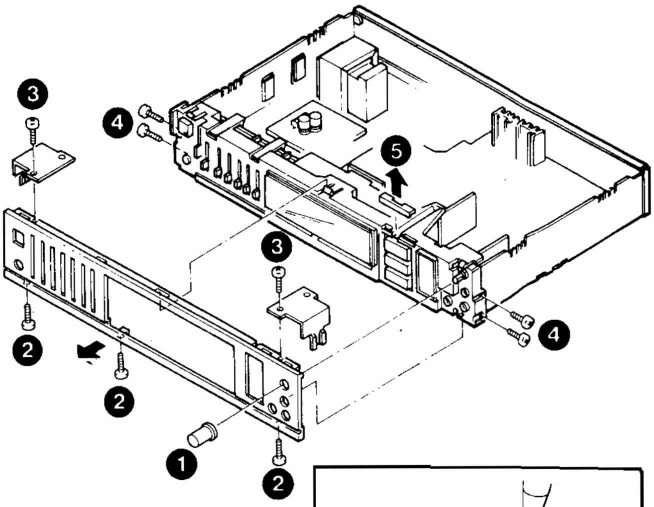
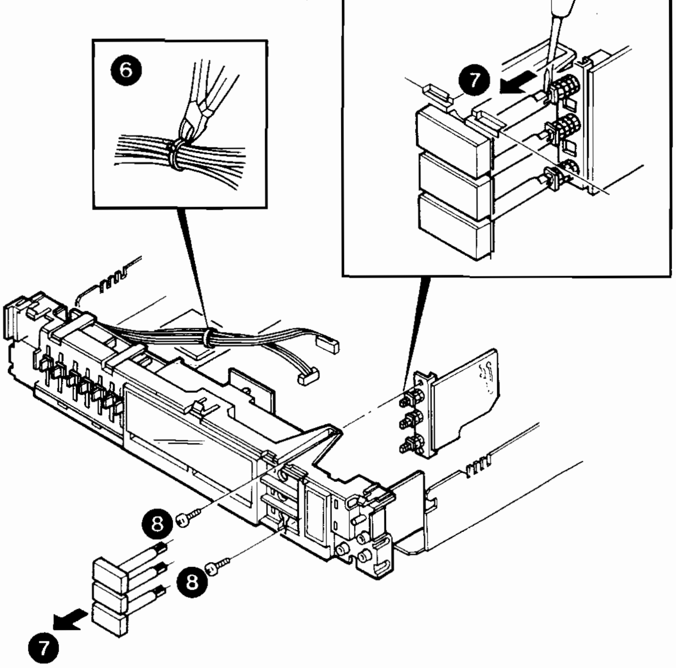
DISASSEMBLY FOR REPAIR

DISASSEMBLY FOR REPAIR

1. Pull off the MIC LEVEL knob (❶).
2. Remove 3 screws at the bottom of the panel and 2 screws and the mounting hardware at the top ends of the panel (❷ , ❸).
3. Remove 4 screws at the sides of the sub panel and pull the small segment on the sub panel above the selector switch knobs (❹ , ❺).



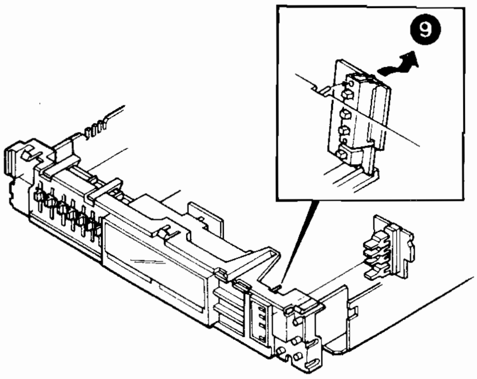
4. Cut the wire band bonding the wires with a wire cutter (❻).
5. Remove 3 knobs for selectors and 2 screws retaining the switches (❼ , ❽).

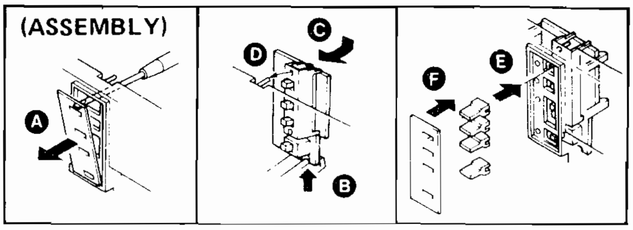


6. Set the switches on X11 (F/8) to switch-on position and tilt the upper side of the pc board rearward and pull up as shown by the arrow (❾).

   (ASSEMBLY)

   a) Push the dressing panel carefully from the back (Ⓐ).
   b) Put the bottom end of the pc board and bring it to upright position. If the position is appropriate, the projection of the sub panel fits into the hole of the switch frame (Ⓒ , Ⓓ).
   c) After fitting 4 knobs to the switches, fit the dressing panel (Ⓔ , Ⓕ).

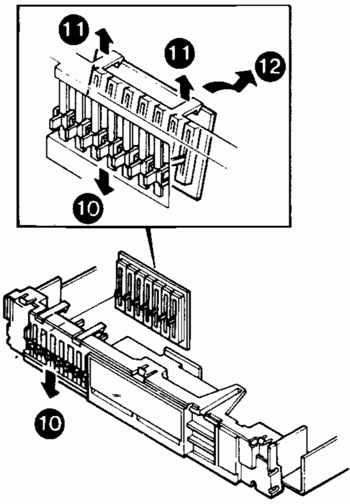


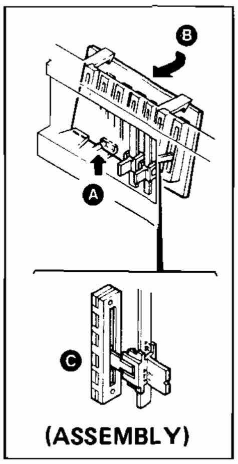


-5
66

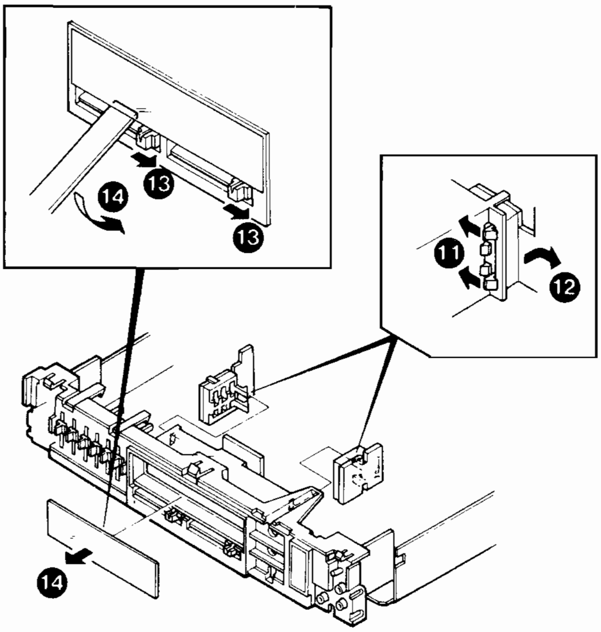
DISASSEMBLY FOR REPAIR

7. Slide all graphic equalizer knobs to the bottom end and release the pc board from the hooks (⑩ , ⑪). Tilt the pc board as shown by the arrow (⑫).
   (ASSEMBLY)
   a) Put the bottom end of the pc board and bring it to upright position. During this procedure, make sure the knobs are fitted into the levers of the slide type potentiometers (Ⓐ ~ Ⓒ).

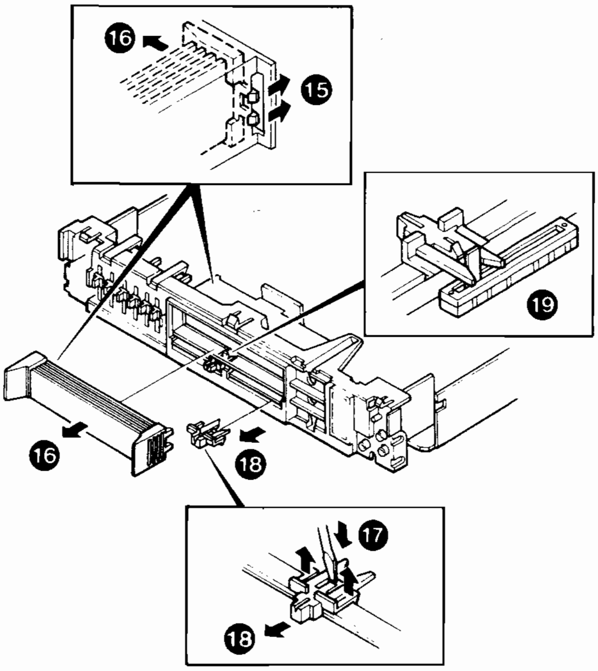




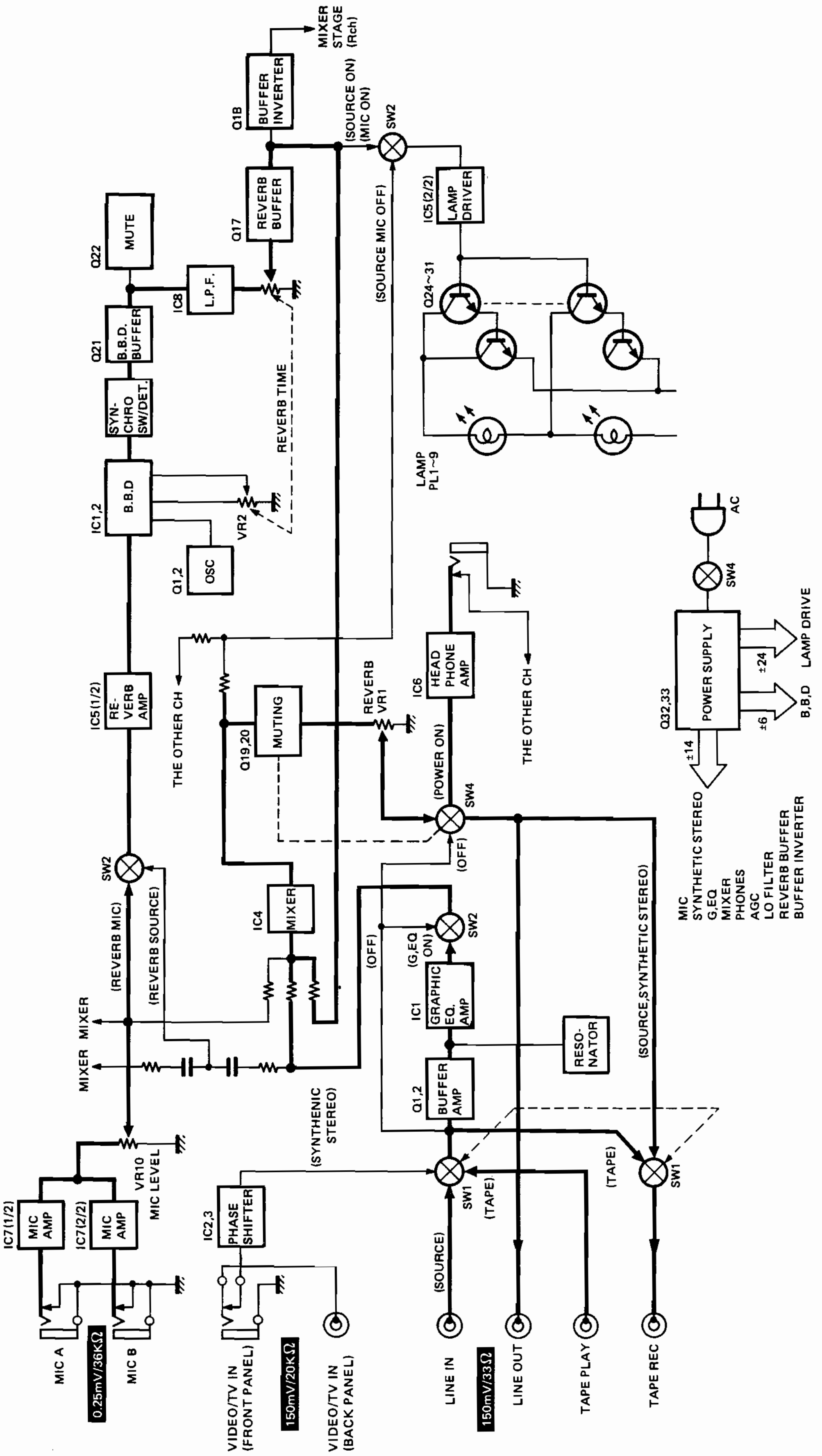
8. To remove the lamp pc boards, pull out while pressing the hooks as shown (⑪, ⑫). The pc board will be removed with the reflector.
9. To remove the reverberation display filters, you need to remove the dressing panel first.
10. Slide the REVERB TIME, OUTPUT LEVEL knobs to the right end (⑬).
11. Use something which does not damage the exterior such as a plastic ruler, and carefully take off the dressing panel (⑭).



12. Release the hook from the rear of the sub panel and pull the reverberation display filters out frontward (⑮ , ⑯).
13. REVERB TIME, OUTPUT LEVEL knobs can be removed by releasing the hooks on the knob (⑰ , ⑱).
    (ASSEMBLY)
    a) The knobs can be snaped onto the rail of the sub panel (⑲). Make sure that the lever of the slide type potentiometer links.



BLOCK DIAGRAM



MIXER STAGE (Rch)
Q18
BUFFER INVERTER
(SOURCE ON) (MIC ON)
SW2
Q17
REVERB BUFFER
Q22
MUTE
IC5(2/2)
LAMP DRIVER
(SOURCE MIC OFF)
IC8
L.P.F.
Q21
B.B.D. BUFFER
SYN-CHRO SW/DET.
Q24~31
REVERB TIME
LAMP PL1~9
IC1,2
B.B.D
VR2
Q1,2
OSC
AC
SW4
IC5(1/2)
RE-VERB AMP
THE OTHER CH
Q19,20
MUTING
REVERB VR1
IC6
HEAD PHONE AMP
THE OTHER CH
Q32,33
POWER SUPPLY
±24
LAMP DRIVE
±6
B,B,D
±14
(POWER ON)
SW4
(OFF)
SW2
(REVERB MIC)
(REVERB SOURCE)
IC4
MIXER
(OFF)
(G,EQ ON)
SW2
IC1
GRAPHIC EQ. AMP
MIXER
MIXER
RESO-NATOR
(SOURCE,SYNTHETIC STEREO)
MIC
SYNTHETIC STEREO
G,EQ
MIXER
PHONES
AGC
LO FILTER
REVERB BUFFER
BUFFER INVERTER
Q1,2
BUFFER AMP
(SYNTHENIC STEREO)
VR10
MIC LEVEL
IC7(1/2)
MIC AMP
IC7(2/2)
MIC AMP
IC2,3
PHASE SHIFTER
SW1
(TAPE)
(SOURCE)
(TAPE)
SW1
MIC A
0.25mV/36KΩ
MIC B
VIDEO/TV IN (FRONT PANEL)
150mV/20KΩ
VIDEO/TV IN (BACK PANEL)
LINE IN
150mV/33Ω
LINE OUT
TAPE PLAY
TAPE REC

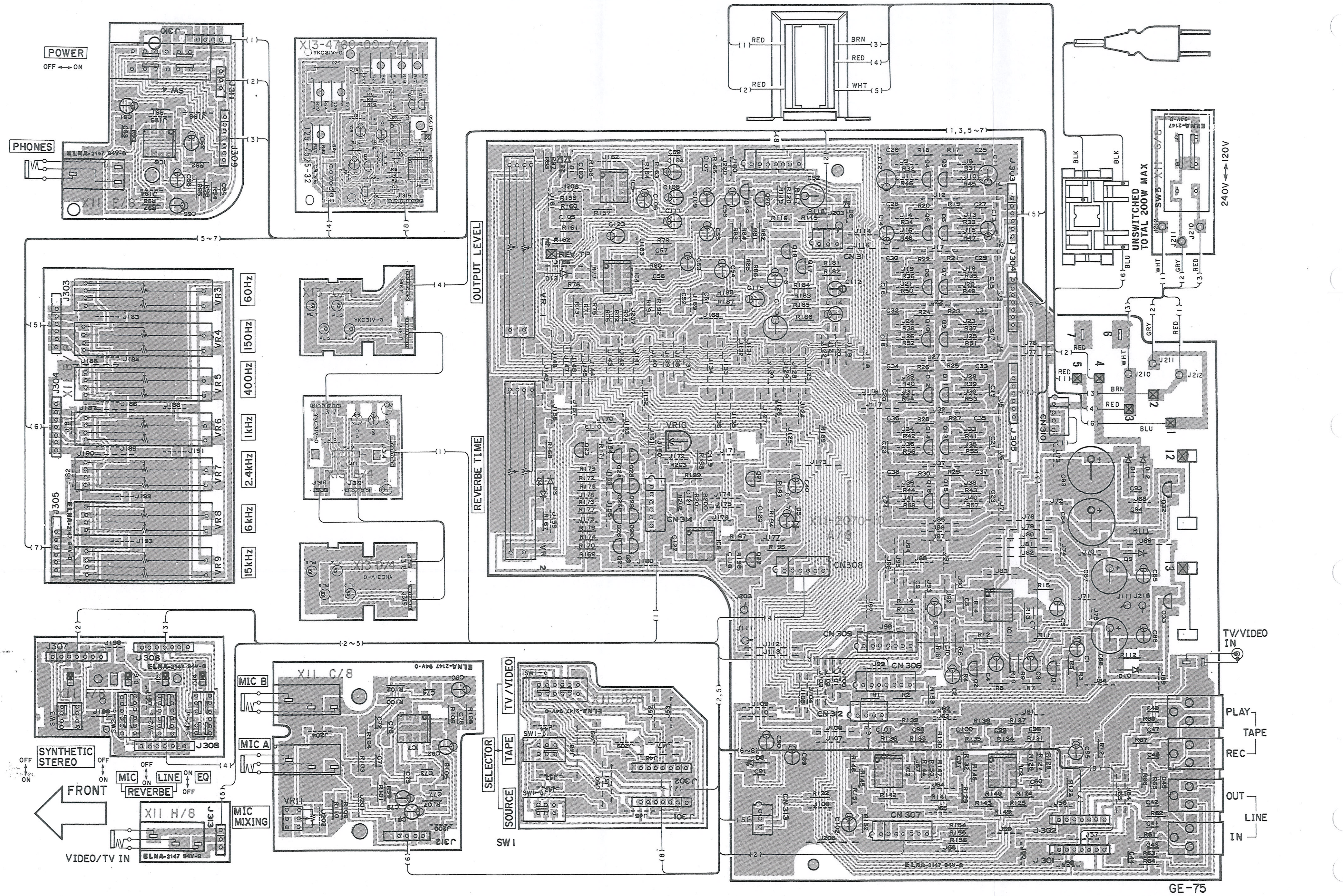
CIRCUIT DESCRIPTION

SUPPLEMENTARY UNIT (X13-4760-10)

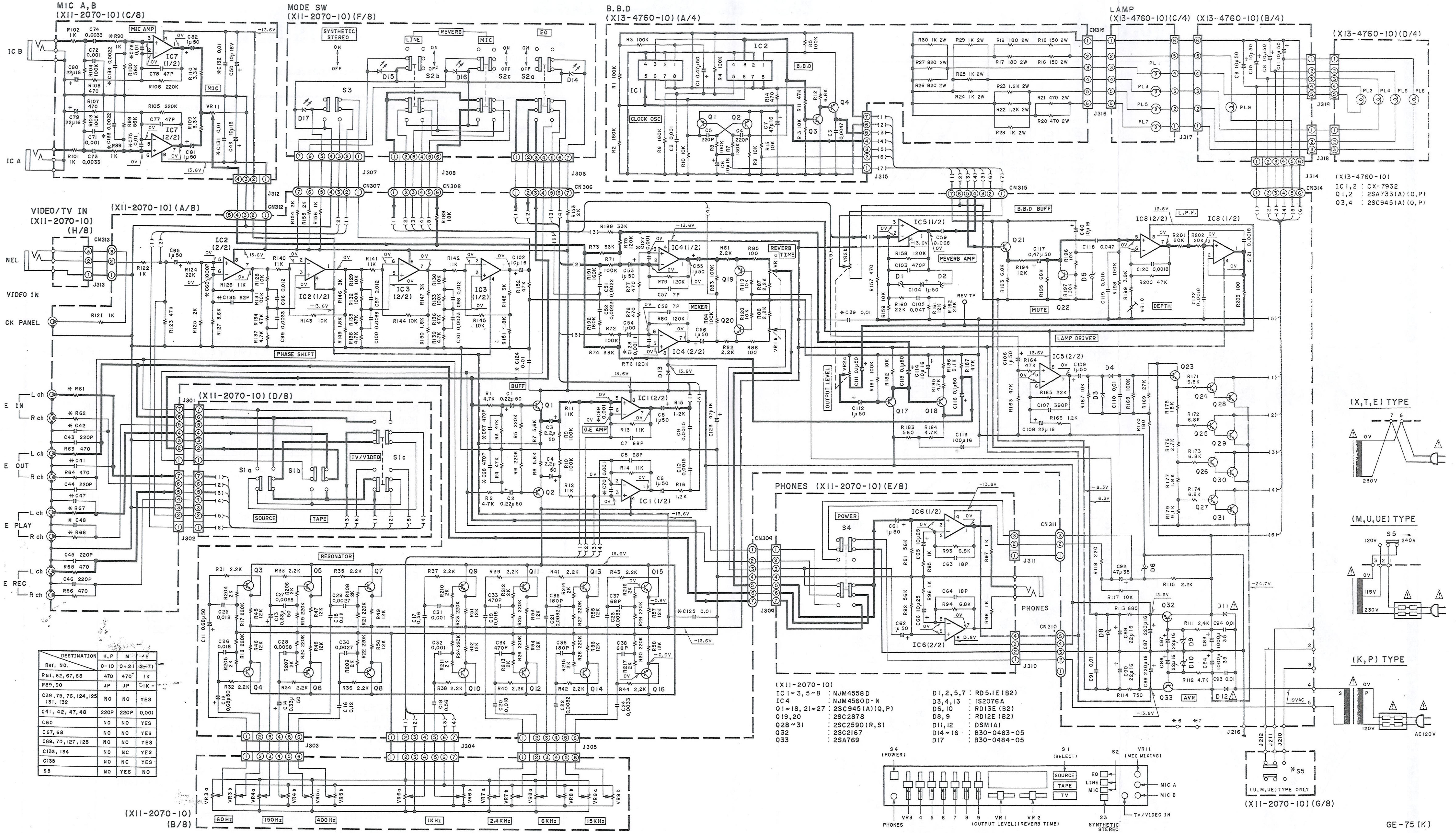
Components	Functions	Operations (Substitutions)
IC1,IC2	BBD	Delay device (Not interchangeable)
Q1,Q2	Oscillator	Variable-frequency multi-vibrator (General Tr)
Q3	Synchro switch	(General Tr)
Q4	Synchronous detector	(General Tr)

GE-75 GE-75

PC BOARD


POWER
OFF ←→ ON
PHONES
XII E/8
X13-4760-00 A/4
OUTPUT LEVEL
REVERBE TIME
60Hz
150Hz
400Hz
1kHz
2.4kHz
6kHz
15kHz
VR3
VR4
VR5
VR6
VR7
VR8
VR9
X13 C/4
X13 B/4
X13 D/4
XII-2070-10 A/8
RED
BRN
WHT
BLK
BLU
GRY
UNSWITCHED TOTAL 200W MAX
SW5
240V ←→ 120V
TV/VIDEO IN
PLAY
TAPE
REC
OUT
LINE
IN
GE-75
SYNTHETIC STEREO
OFF
ON
MIC
LINE
EQ
REVERBE
FRONT
XII H/8
VIDEO/TV IN
MIC B
MIC A
MIC MIXING
XII C/8
TV/VIDEO
TAPE
SOURCE
SELECTOR
SW1
XII D/8

Refer to the schematic diagram for the values of resistors and capacitors.
The PC board drawing is viewed from the side easy to check.


MIC A,B (X11-2070-10)(C/8)
MIC AMP
IC7 (1/2)
IC7 (2/2)
MIC
IC B
IC A
MODE SW (X11-2070-10)(F/8)
SYNTHETIC STEREO
REVERB
LINE
MIC
EQ
S2b
S2c
S2a
S3
D14
D15
D16
D17
B.B.D (X13-4760-10)(A/4)
IC1
IC2
B.B.D
CLOCK OSC
LAMP (X13-4760-10)(C/4) (X13-4760-10)(B/4)
(X13-4760-10)(D/4)
PL1
PL2
PL3
PL4
PL5
PL6
PL7
PL8
PL9
VIDEO/TV IN (X11-2070-10)(H/8)
(X11-2070-10)(A/8)
NEL
VIDEO IN
CK PANEL
IC2 (2/2)
IC2 (1/2)
IC3 (2/2)
IC3 (1/2)
PHASE SHIFT
IC4 (1/2)
IC4 (2/2)
REVERB TIME
MIXER
B.B.D BUFF
IC5 (1/2)
REVERB AMP
L.P.F.
IC8 (2/2)
IC8 (1/2)
MUTE
DEPTH
LAMP DRIVER
IC5 (2/2)
OUTPUT LEVEL
BUFF
IC1 (2/2)
IC1 (1/2)
G.E AMP
(X11-2070-10)(D/8)
E IN
E OUT
E PLAY
E REC
L ch
R ch
S1a
S1b
S1c
TV/VIDEO
SOURCE
TAPE
RESONATOR
PHONES (X11-2070-10)(E/8)
POWER
S4
IC6 (1/2)
IC6 (2/2)
PHONES
AVR
(X,T,E) TYPE
(M,U,UE) TYPE
(K,P) TYPE
S5
230V
120V
240V
115V
AC120V
19VAC
(X11-2070-10)(B/8)
60Hz
150Hz
400Hz
1KHz
2.4KHz
6KHz
15KHz
S4 (POWER)
S1 (SELECT)
S2
VR11 (MIC MIXING)
EQ
LINE
MIC
MIC A
MIC B
SOURCE
TAPE
TV
PHONES
VR3 4 5 6 7 8 9
VR1 (OUTPUT LEVEL)
VR2 (REVERB TIME)
S3 SYNTHETIC STEREO
TV/VIDEO IN
*S5
(U,M,UE) TYPE ONLY
(X11-2070-10)(G/8)
GE-75 (K)

DESTINATION / Ref. NO.	K, P 0-10	M 0-21	E 2-71
R61, 62, 67, 68	470	470	1K
R89, 90	JP	JP	1K
C39, 75, 76, 124, 125 131, 132	NO	NO	YES
C41, 42, 47, 48	220P	220P	0,001
C60	NO	NO	YES
C67, 68	NO	NO	YES
C69, 70, 127, 128	NO	NO	YES
C133, 134	NO	NC	YES
C135	NO	NC	YES
S5	NO	YES	NO

(X11-2070-10)

IC1~3, 5~8	NJM4558D
IC4	NJM4560D-N
Q1~18, 21~27	2SC945(A)(Q,P)
Q19, 20	2SC2878
Q28~31	2SC2590(R,S)
Q32	2SC2167
Q33	2SA769

D1, 2, 5, 7	RD5.1E(B2)
D3, 4, 13	1S2076A
D6, 10	RD13E(B2)
D8, 9	RD12E(B2)
D11, 12	DSM1A1
D14~16	B30-0483-05
D17	B30-0484-05

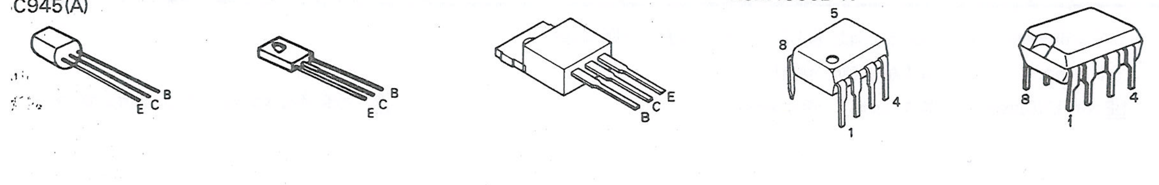
(X13-4760-10)

IC1, 2	CX-7932
Q1, 2	2SA733(A)(Q,P)
Q3, 4	2SC945(A)(Q,P)

A733(A)
C2878
C945(A)

NJM4558D
NJM4560D-N

CX-7932


E
C
B
E
C
B
B
C
E
5
8
4
1
8
1

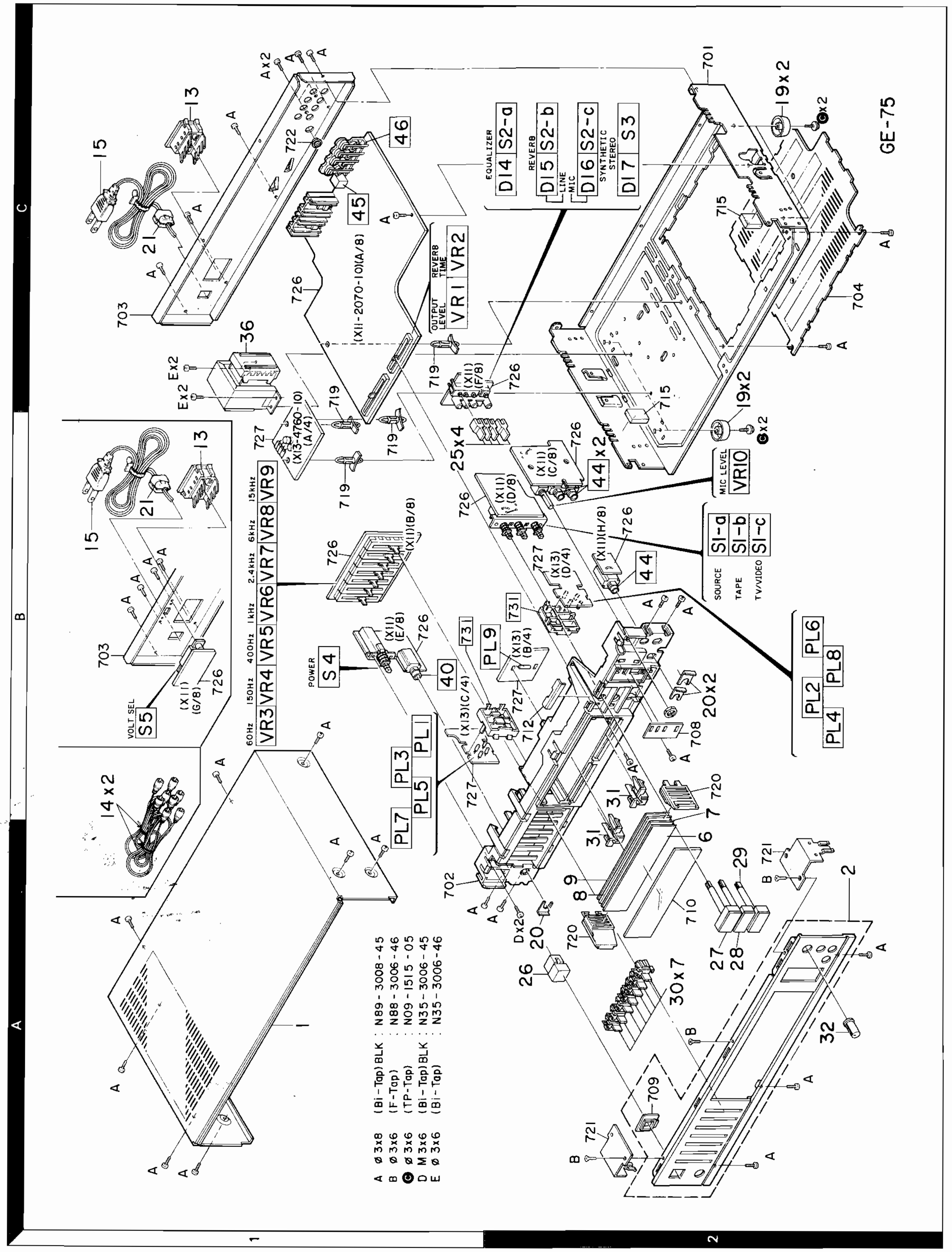
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

- DC voltages are measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

GE-75

KENWOOD

EXPLODED VIEW


GE-75
1
2
6
7
8
9
13
14x2
15
19x2
20x2
21
25x4
26
27
28
29
30x7
31
32
36
40
44
44x2
45
46
701
702
703
704
708
709
710
712
715
719
720
721
722
726
727
731
EQUALIZER D14 S2-a
REVERB D15 S2-b
LINE MIC D16 S2-c
SYNTHETIC STEREO D17 S3
OUTPUT LEVEL VR1
REVERB TIME VR2
MIC LEVEL VR10
SOURCE S1-a
TAPE S1-b
TV/VIDEO S1-c
POWER S4
VOLT.SEL S5
60Hz VR3
150Hz VR4
400Hz VR5
1kHz VR6
2.4kHz VR7
6kHz VR8
15kHz VR9
PL1
PL2
PL3
PL4
PL5
PL6
PL7
PL8
PL9
(X11-2070-10)(A/8)
(X13-4760-10)(A/4)
(X11)(B/8)
(X11)(C/8)
(X11)(D/8)
(X11)(E/8)
(X11)(F/8)
(X11)(G/8)
(X11)(H/8)
(X13)(B/4)
(X13)(C/4)
(X13)(D/4)
Ax2
Ex2
Dx2
Gx2
A ø3x8 (Bi-Tap)BLK : N89-3008-45
B ø3x6 (F-Tap) : N88-3006-46
G ø3x6 (TP-Tap)BLK : N09-1515-05
D M3x6 (Bi-Tap)BLK : N35-3006-45
E ø3x6 (Bi-Tap) : N35-3006-46
A
B
C
1
2

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

⁎ New Parts

Parts without **Parts No.** are not supplied.

Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位 置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕 向	Re-marks 備考
				GE-75		
1	1A	⁎	A01-1492-01	METALLIC CABINET		
2	2A	⁎	A20-4909-02	PANEL ASSY		
6	2A	⁎	B20-0607-03	SCALE (1)		
7	2B	⁎	B20-0608-03	SCALE (2)		
8	2A	⁎	B20-0609-03	SCALE (3)		
9	2A	⁎	B20-0610-03	SCALE (4)		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0096-13	WARRANTY CARD	X	
-			B46-0121-03	WARRANTY CARD	P	
-			B46-0122-13	WARRANTY CARD	E	
-		⁎	B50-6264-00	INSTRUCTION MANUAL		
-		⁎	B50-6265-00	INSTRUCTION MANUAL	PMXE	
-		⁎	B50-6266-00	INSTRUCTION MANUAL	M	
-		⁎	B50-6274-00	INSTRUCTION MANUAL	M	
-		⁎	B50-6275-00	INSTRUCTION MANUAL	E	
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0245-33	CAUTION CARD (FTZ)	E	
-			B58-0269-04	CAUTION CARD	K	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
-			B59-0050-00	SERVICE DIRECTORY	E	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
13	1C		E03-0064-05	AC OUTLET	UMUE	
13	1C		E03-0072-05	AC OUTLET	KP	
14	1B		E30-0505-05	AUDIO CORD		
15	1C		E30-0459-05	AC POWER CORD	E	
15	1C		E30-0812-05	AC POWER CORD	UMUE	
15	1C		E30-0996-05	AC POWER CORD	KP	
15	1C		E30-1341-05	AC POWER CORD	X	
-		⁎	H01-7221-04	ITEM CARTON CASE		
-			H10-1686-12	POLYSTYRENE FOAMED FIXTURE		
-			H25-0223-04	PROTECTION BAG (750X350)		
-			H25-0232-04	PROTECTION BAG (235X350)		
19	2C		J02-0161-04	FOOT		
20	2A,2B		J21-3326-05	JACK MOUNTING HARDWARE		
21	1C		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
25	1B		K27-1250-04	KNOB (BUTTON) EQ,REV,SYNTHE		
26	2A		K29-2001-04	KNOB ASSY(BTN) POWER		
27	2A	⁎	K29-2453-04	KNOB ASSY(BTN) SOURCE		
28	2A	⁎	K29-2454-04	KNOB ASSY(BTN) TAPE		
29	2A	⁎	K29-2455-04	KNOB ASSY(BTN) TV/VIDEO		
30	2A		K29-1974-04	KNOB (LEVER) GRAPHIC EQ.		
31	2A,2B		K29-1975-04	KNOB (LEVER) OUTPUT,REVERB		
32	2A		K29-1736-04	KNOB MIC MIXING		
36	1C		L01-3901-05	POWER TRANSFORMER	K	
36	1C		L01-3902-05	POWER TRANSFORMER	XE	
36	1C		L01-3904-05	POWER TRANSFORMER	UMUEA	
36	1C		L01-3907-05	POWER TRANSFORMER	P	

E: Scandinavia & Europe H:Audio Club K: USA P: Canada W:Europe
T: England U: PX(Far East, Hawaii)
UE : AAFES(Europe) X: Australia M: Other Areas

⚠ indicates safety critical components.

PARTS LIST

⁎ New Parts

Parts without **Parts No.** are not supplied.

Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
TONE UNIT (X11-2070-10)						
D14 -16	2C		B30-0483-05	LED(SLP-170B) EQ,REVERB		
D17	2C		B30-0484-05	LED(SLP-270B) SYNTHE,STEREO		
C1 ,2			CE04FW1HR22M	ELECTRO 0.22UF 50WV		
C3 ,4			CE04FW1H2R2M	ELECTRO 2.2UF 50WV		
C5 ,6			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C7 ,8			CC45FSL1H680J	CERAMIC 68PF J		
C9 ,10			CF92FV1H152J	MF 1500PF J		
C11 ,12			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C13 ,14			CE04FW1HR33M	ELECTRO 0.33UF 50WV		
C15 ,16			CF92FV1H124J	MF 0.12UF J		
C17 ,18			CF92FV1H563J	MF 0.056UF J		
C19 ,20			CF92FV1H183J	MF 0.018UF J		
C21 ,22			CF92FV1H822J	MF 8200PF J		
C23 ,24			CF92FV1H332J	MF 3300PF J		
C25 ,26			CF92FV1H183J	MF 0.018UF J		
C27 ,28			CF92FV1H682J	MF 6800PF J		
C29 ,30			CF92FV1H272J	MF 2700PF J		
C31 ,32			CF92FV1H102J	MF 1000PF J		
C33 ,34			CK45FB1H471K	CERAMIC 470PF K		
C35 ,36			CC45FSL1H181J	CERAMIC 180PF J		
C37 ,38			CC45FSL1H680J	CERAMIC 68PF J		
C39			CK45FF1H103Z	CERAMIC 0.010UF Z	XE	
C40			CE04FW1C100M	ELECTRO 10UF 16WV		
C41 -48			CC45FSL1H221J	CERAMIC 220PF J	KPUMUE	
C41 -48			CC45FSL1H221J	CERAMIC 220PF J		
C41 ,42			CK45FB1H102K	CERAMIC 1000PF K	XE	
C43 -46			CC45FSL1H221J	CERAMIC 220PF J	XE	
C47 ,48			CK45FB1H102K	CERAMIC 1000PF K	XE	
C49 ,50			CE04FW1H100M	ELECTRO 10UF 50WV		
C51 ,52			CF92FV1H222J	MF 2200PF J		
C53 -55			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C56			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C57 ,58			CC45FSL1H070D	CERAMIC 7.0PF D		
C59			CF92FV1H683J	MF 0.068UF J		
C60			CK45FB1H102K	CERAMIC 1000PF K	XE	
C61 ,62			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C63 ,64			CC45FSL1H180J	CERAMIC 18PF J		
C65 ,66			CE04FW1E100M	ELECTRO 10UF 25WV		
C67 ,68			CK45FB1H471K	CERAMIC 470PF K	XE	
C69 ,70			CK45FB1H102K	CERAMIC 1000PF K	XE	
C71 ,72			CF92FV1H102J	MF 1000PF J		
C73 ,74			CF92FV1H332J	MF 3300PF J		
C75 ,76			CK45FF1H103Z	CERAMIC 0.010UF Z	XE	
C77 ,78			CC45FSL1H470J	CERAMIC 47PF J		
C79 ,80			CE04FW1C220M	ELECTRO 22UF 16WV		
C81			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C82			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C83 ,84			CE04FW1V102M	ELECTRO 1000UF 35WV		
C85 ,86			CE04FW1C220M	ELECTRO 22UF 16WV		
C87 ,88			CE04FW1C221M	ELECTRO 220UF 16WV		
C89 ,90			CE04FW1C220M	ELECTRO 22UF 16WV		
C91			CF92FV1H103J	MF 0.010UF J		

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PARTS LIST

⁎ New Parts

Parts without **Parts No.** are not supplied.

Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
C92			CE04FW1V470M	ELECTRO 47UF 35WV		
C93 ,94			CF92FV1H103J	MF 0.010UF J		
C95			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C96 -98			CF92FV1H123J	MF 0.012UF J		
C99 -101			CF92FV1H332J	MF 3300PF J		
C102			CE04FW1C100M	ELECTRO 10UF 16WV		
C103			CK45FB1H471K	CERAMIC 470PF K		
C104			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C105			CF92FV1H473J	MF 0.047UF J		
C106			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C107			CK45FB1H391K	CERAMIC 390PF K		
C108			CE04FW1C220M	ELECTRO 22UF 16WV		
C109			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C110			CF92FV1H103J	MF 0.010UF J		
C111			CE04FW1H0R1M	ELECTRO 0.1UF 50WV		
C112			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C113			CE04FW1C101M	ELECTRO 100UF 16WV		
C114			CE04FW1C100M	ELECTRO 10UF 16WV		
C115,116			CE04FW1H0R1M	ELECTRO 0.1UF 50WV		
C117			CE04FW1HR47M	ELECTRO 0.47UF 50WV		
C118			CF92FV1H473J	MF 0.047UF J		
C119			CF92FV1H153J	MF 0.015UF J		
C120			CF92FV1H182J	MF 1800PF J		
C121			CF92FV1H183J	MF 0.018UF J		
C122			CF92FV1H182J	MF 1800PF J		
C123			CE04FW1C470M	ELECTRO 47UF 16WV		
C124,125			CK45FF1H103Z	CERAMIC 0.010UF Z	XE	
C127,128			CK45FB1H102K	CERAMIC 1000PF K	XE	
C131,132			CK45FF1H103Z	CERAMIC 0.010UF Z	XE	
C133,134			CK45FB1H222K	CERAMIC 2200PF K	XE	
C135			CC45FSL1H820J	CERAMIC 82PF J	XE	
40	1B		E11-0104-15	PHONE JACK (3P)PHONES		
44	2B		E11-0141-05	PHONE JACK (2P)MIC,TV/VI		
45	1C		E13-0119-05	PHONO JACK (1P)TV/VI IN		
46	1C		E13-0814-05	PHONO JACK (8P)		
VR1 ,2	1C		R13-3021-05	POTENTIOMETER(20KX2)OUTPUT REV		
VR3 -9	1B		R13-5055-05	POTENTIOMETER(100KX2)GE		
VR10	2B		R10-4018-05	POTENTIOMETER(50K) MIC LEVEL		
VR11			R12-2305-05	TRIMMING POT.(5K)REV DEPTH		
S1	2B		S42-3090-05	MULTI PUSH SW(SOURCE,TAPE,TV)		
S2	2C		S42-3091-05	MULTI PUSH SW(EQ,REV LINE/MIC)		
S3	2C		S40-2336-05	PUSH SWITCH(SYNTHETIC STEREO)		
S4	1B	*	S40-4061-05	PUSH SWITCH(POWER)		
S5	1B		S31-2083-05	SLIDE SWITCH (POWER TYPE)	UMUE	
D1 ,2			RD5.1E(B2)	ZENER DIODE		
D3 ,4			1S2076A	DIODE		
D5			RD5.1E(B2)	ZENER DIODE		
D6			RD13E(B2)	ZENER DIODE		
D8 ,9			RD12E(B2)	ZENER DIODE		
D10			RD13E(B2)	ZENER DIODE		
D11 ,12			DSM1A1	DIODE		
D13			1S2076A	DIODE		
IC1 -3			NJM4558D	IC(OP AMP X2)		
IC4			NJM4560D-N	IC(OP AMP X2)		

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IC5 -8			NJM4558D	IC(OP AMP X2)		
Q1 -18			2SC945(A)(Q,P)	TRANSISTOR		
Q19 ,20			2SC2878	TRANSISTOR		
Q21 -27			2SC945(A)(Q,P)	TRANSISTOR		
Q28 -31			2SC2590(R,S)	TRANSISTOR		
Q32			2SC2167	TRANSISTOR		
Q33			2SA769	TRANSISTOR		
SUB CIRCUIT UNIT (X13-4760-10)						
PL1 ,2	1B,2B		B30-1064-05	LAMP (12V, 60MA)BLU		
PL3 ,4	1B,2B		B30-1065-05	LAMP (12V, 60MA)GRN		
PL5 ,6	1B,2B		B30-1066-05	LAMP (12V, 60MA)YEL		
PL7 ,8	1B,2B		B30-1067-05	LAMP (12V, 60MA)RED		
PL9	2B		B30-1078-05	LAMP (12V,110MA)		
C1			CE04FW1HR47M	ELECTRO 0.47UF 50WV		
C2			CF92FV1H102J	MF 1000PF J		
C3			CF92FV1H472J	MF 4700PF J		
C4 ,5			CC45FSL1H221J	CERAMIC 220PF J		
C6			CE04FW1C100M	ELECTRO 10UF 16WV		
C7			CE04FW1C470M	ELECTRO 47UF 16WV		
C8 -11			CE04JW1H100M	ELECTRO 10UF 50WV		
R16			RS14DB3D151J	FL-PROOF RS 150 J 2W	KPXE	
R16 -19			RS14DB3D181J	FL-PROOF RS 180 J 2W	UMUE	
R17			RS14DB3D181J	FL-PROOF RS 180 J 2W	KPXE	
R18			RS14DB3D151J	FL-PROOF RS 150 J 2W	KPXE	
R19			RS14DB3D181J	FL-PROOF RS 180 J 2W	KPXE	
R20 ,21			RS14DB3D471J	FL-PROOF RS 470 J 2W	KPXE	
R20 ,21			RS14DB3D561J	FL-PROOF RS 560 J 2W	UMUE	
R22 -24			RS14DB3D122J	FL-PROOF RS 1.2K J 2W	UMUE	
R22 ,23			RS14DB3D122J	FL-PROOF RS 1.2K J 2W	KPXE	
R24			RS14DB3D102J	FL-PROOF RS 1.0K J 2W	KPXE	
R25			RS14KB3D102J	FL-PROOF RS 1.0K J 2W	KPXE	
R25			RS14KB3D122J	FL-PROOF RS 1.2K J 2W	UMUE	
R26			RS14DB3D821J	FL-PROOF RS 820 J 2W		
R27			RS14KB3D102J	FL-PROOF RS 1.0K J 2W	UMUE	
R27			RS14KB3D821J	FL-PROOF RS 820 J 2W	KPXE	
R28			RS14DB3D102J	FL-PROOF RS 1.0K J 2W	KPXE	
R28			RS14DB3D152J	FL-PROOF RS 1.5K J 2W	UMUE	
R29			RS14KB3D102J	FL-PROOF RS 1.0K J 2W	KPXE	
R29			RS14KB3D122J	FL-PROOF RS 1.2K J 2W	UMUE	
R30			RS14DB3D102J	FL-PROOF RS 1.0K J 2W		
IC1 ,2			CX-7932	IC(1024-STAGE BBD)		
Q1 ,2			2SA733(A)(Q,P)	TRANSISTOR		
Q3 ,4			2SC945(A)(Q,P)	TRANSISTOR		

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SPECIFICATIONS

EQUALIZER

Equalizer characteristics	
Variable range	±10 dB
Individual channel adjust	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz

REVERB

Reverberating time	0 to 1.4 sec
Delay time	0 to 5.5 msec

MIC

Input sensitivity	0.25 mV
Input impedance	36 k ohms

SYNTHETIC STEREO

Input sensitivity	150 mV
Input impedance	20 k ohms

LINE

Total harmonic distortion	Less than 0.03% (20 Hz to 20 kHz at 1 V output)
Gain	0 dB
Maximum output voltage	4 V (at 1 kHz THD 0.05% load 47 k ohms) 7 V (at 1 kHz THD 0.05% load 47 k ohms)
Frequency response	20 Hz to 30 kHz, +0 dB, −3 dB
Signal to noise ratio	94 dB (Input short, A net work)
Attenuation	−20 dB (at 1 kHz)
Input impedance	33 k ohms
Input sensitivity	150 mV
Output impedance	2.8 k ohms

GENERAL

AC outlet	Unswitched 2, total 200 W Max (Except for some areas)
Power consumption	23 W
Dimensions	W 420 mm (16-17/32") H 90 mm (3-17/32") D 268 mm (10-9/16")
Weight (Net)	3.8 kg (8.4 lb)

Note:
We follow a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note:
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

TRIO-KENWOOD CORPORATION
Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan
KENWOOD ELECTRONICS
DIVISION OF KENWOOD U.S.A. CORPORATION
1315 E. Watsoncenter Rd., Carson, California 90745; U.S.A.
75 Seaview Drive, Secaucus, New Jersey 07094, U.S.A.
TRIO-KENWOOD CANADA INC.,
1070 Jayson Court, Mississauga, Ontario, Canada L4W 2V5
TRIO-KENWOOD ELECTRONICS, N.V.
Leuvensesteenweg 504 B-1930 Zaventem, Belgium
TRIO-KENWOOD ELECTRONICS GmbH
Rembrücker Str. 15, 6056 Heusenstamm, West Germany
TRIO-KENWOOD FRANCE S.A.
5, Boulevard Ney, 75018 Paris, France
TRIO-KENWOOD (AUSTRALIA) PTY. LTD. (INCORPORATED IN N.S.W.)
4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia
KENWOOD & LEE ELECTRONICS, LTD.
Wang Kee Building, 5th Floor, 34-37, Connaught Road, Central, Hong Kong

CIRCUIT DESCRIPTION

Function of elements

TONE UNIT (X11-2070-10)

Components	Functions	Operations (Substitutions)
IC1	Graphic EQ. amp	Amplifier for graphic equalizer (General dual 14P)
IC2,IC3	Synthetic stereo	Phase shifter (General-purpose DIP 14P)
IC4	Mixer	Mixing of source, reverb and microphone signals.
IC5 (1/2)	Reverb amp	For reverberation, with AGC and frequency limiter.
IC5 (2/2)	Lamp driver amp	Amplification up to the level required for lamp drive.
IC6	Phone amp	L, R
IC7	MIC amp	MIC A & B
IC8	Low-pass filter	BBD clock elimination.
Q1,Q2	Graphic EQ. buffer	(Q1~Q27 are general-purpose transistors except for Q19 and Q20.)
Q3~Q16	Graphic EQ. semiconductor L	(Q1~Q27 are general-purpose transistors except for Q19 and Q20.)
Q17	Reverb buffer	(Q1~Q27 are general-purpose transistors except for Q19 and Q20.)
Q18	Reverb buffer inverter	(Q1~Q27 are general-purpose transistors except for Q19 and Q20.)
Q19,Q20	MUTE	Muting (signal) when power is switched ON. (V_{BE} inverted, withstand voltage 12V or more.)
Q21	BBD circuit buffer	For driving the low-pass filter.
Q22	MUTE	When power is switched ON (display and signal)
Q23	Emitter follower	Lamp lighting level shift.
Q24~Q27	Darlington driver	A darlington amplifier drives the lamps.
Q28~Q31	LAMP driver	(For Q28~Q31, use transistors with Pc of 750mW or more.)
Q32,Q33	Power supply	(General-purpose T0-220 type)
D1,D2	Level control Zener diodes	For protection of BBD when converting the level from ±12V to ±6V. If no consideration is given for the D range of REV signal, use of Zener diodes with about 3V is possible.
D5	Ripple elimination Zener diode	For eliminating ripple when muting (REVERB)
D6	Ripple elimination Zener diode	For eliminating ripple when muting (MIXER)
D8	Power supply Zener diode	±6V power supply. When the Zener voltage is too high, the BBD may be damaged ($\pm V_{BB}$ max. ±7V.) When the voltage is too low, the clock may stop.
D9,D10	Power supply Zener diode	±15V power supply. When the Zener voltage becomes 14V, the current flowing to lamps may increase, resulting in heating.
D11,D12	Power supply rectifier diode	(Interchangeable with diodes of W0-6B class or higher)
D3,D4	Voltage multiplying rectifier diode	(Interchangeable with any type of small-signal Si diodes)
D13	Backup diode	For countermeasure against shock noise when power is switched on again.
D12~D16	Position indicator LED (red)	
D17	Position indicator LED (green)	